WHAT IS CLAIMED IS:

1. A method in a radio frequency identification (RFID) tag device for controlling an operating state of the tag device using a reader, wherein the operating state is chosen from a plurality of possible states, comprising the steps of:

(a) receiving a symbol from the reader when the operating state is a present state;

(b) determining a new state for the operating state based upon the received symbol and present state; and

(c) transitioning the operating state from the present state to the determined new state.

2. The method of claim 1, wherein step (c) includes the step of:

transitioning the operating state from the present state to the determined new state without receiving any symbols from the reader other than in step (a).

3. The method of claim 2, further comprising the step of:

(d) repeating steps (a)-(c).

4. The method of claim 1, wherein step (a) includes the step of:

determining the received symbol to be a data "0," data "1," or data "NULL."

5. The method of claim 1, wherein step (c) includes the step of:

transmitting a symbol from the tag device to the reader.

6. The method of claim 5, wherein the symbol transmitted to the reader includes a bit of an identification number, wherein said transmitting step includes the step of:

transmitting the bit of the identification number.

7. The method of claim 1, further comprising the step of:

(d) performing steps (a)-(c) regardless of whether the reader is performing a general read interrogation or a specific read interrogation.

8. A method in a radio frequency identification (RFID) tag device for controlling an operating state of the tag device using a reader, comprising the steps of:

receiving a symbol from the reader; and

determining a new state for the operating state of the tag device, wherein said determining step includes the steps of:

(a) allowing the operating state to remain in a first state if the operating state is the first state when the symbol is received,

(b) transitioning the operating state to the first state if the operating state is a second state when the symbol is received,

(c) transitioning the operating state to a third state if the operating state is a fourth state when the symbol is received, and

(d) transitioning the operating state to the first state if the operating state is a fifth state when the symbol is received.

9. The method of claim 8, wherein the first state is a command state, wherein step (a) includes the step of:

allowing the operating state to remain in the command state if the operating state is the command state when the symbol is received.

10. The method of claim 8, wherein the first state is a command state and the second state is a superposition state, wherein step (b) includes the step of:

transitioning the operating state to the command state if the operating state is the superposition state when the symbol is received.

11. The method of claim 8, wherein the third state is a dormant state and the fourth state is a tree traversal state, wherein step (c) includes the step of:

transitioning the operating state to the dormant state if the operating state is the tree traversal state when the symbol is received.

12. The method of claim 8, wherein the first state is a command state and the fifth state is a mute state, wherein step (d) includes the step of:

transitioning the operating state to the command state if the operating state is the mute state when the symbol is received.

13. The method of claim 8, wherein the received symbol is a "NULL" symbol, wherein the receiving step includes the step of:

receiving a "NULL" symbol from the reader.

14. A method in a radio frequency identification (RFID) tag device for controlling an operating state of the tag device from a reader, comprising the steps of:

receiving a symbol from the reader; and

determining a new state for the operating state of the tag device, wherein said determining step includes the steps of:

(a) if the operating state is a first state when the symbol is received in said receiving step, performing the following steps:

(1) transitioning the operating state to a fourth state if a value of the received symbol is a first data value, and

(2) transitioning the operating state to a second state if the value of the received symbol is a second data value;

(c) allowing the operating state to remain the second state if the operating state is the second state when the symbol is received in said receiving step;

(d) if the operating state is the fourth state when the symbol is received in said receiving step, performing the following steps:

(3) allowing the operating state to remain the fourth state if the received symbol matches a present tag identification bit, and

(4) transitioning the operating state to a fifth state if the received symbol does not match the present tag identification bit; and

(e) allowing the operating state to remain the fifth state if the operating state is the fifth state when the symbol is received in said receiving step.

15. The method of claim 14, wherein the first state is a command state and the fourth state is a tree traversal state, wherein step (a)(1) includes the step of:

transitioning the operating state to a tree traversal state if a value of the received symbol is a first data value.

16. The method of claim 14, wherein the first state is a command state and the second state is a superposition state, wherein step (a)(2) includes the step of:

transitioning the operating state to a superposition state if the value of the received symbol is a second data value.

17. The method of claim 14, wherein the second state is a superposition state, wherein step (c) includes the step of:

allowing the operating state to remain the superposition state if the operating state is the superposition state when the symbol is received in said receiving step.

18. The method of claim 14, wherein the fourth state is a tree traversal state, wherein step (d)(3) includes the step of:

allowing the operating state to remain the tree traversal state if the received symbol matches a present tag identification bit.

19. The method of claim 14, wherein the fourth state is a tree traversal state and the fifth state is a mute state, wherein step (d)(3) includes the step of:

transitioning the operating state to a mute state if the received symbol does not match the present tag identification bit.

20. The method of claim 14, wherein the fifth state is a mute state, wherein step (e) includes the step of:

allowing the operating state to remain the mute state if the operating state is the mute state when the symbol is received in said receiving step.

21. The method of claim 14, wherein the first data value is a "0" symbol and the fourth state is a tree traversal state, wherein step (1) includes the step of:

(1) if a value of the received symbol is a "0" symbol, transitioning the operating state to the tree traversal state.

22. The method of claim 14, wherein the second data value is a "1" symbol and the second state is a superposition state, wherein step (2) includes the step of:

(2) if the value of the received symbol is a "1" symbol, transitioning the operating state to the superposition state.

23. A method in a radio frequency identification (RFID) tag device for communicating with a reader using a binary traversal, wherein the tag device stores a bit pattern, comprising the steps of:

(a) designating a first bit of the bit pattern as a present symbol;

(b) receiving a symbol from the reader;

(c) transmitting the present symbol to the reader;

(d) receiving a next symbol from the reader;

(e) if a data value of the received next symbol is not equal to a data value of the transmitted present symbol, proceeding to step (h);

(f) if the data value of the received next symbol is equal to a data value of the transmitted present symbol, designating a next bit of the bit pattern as the present symbol;

(g) returning to step (c); and

(h) exiting the binary traversal.

24. The method of claim 23, wherein step (f) includes the step of:

(1) determining whether all bits of the bit pattern have been transmitted to the reader;

(2) if it is determined that all bits of the bit pattern have not been transmitted to the reader, performing the following step:

if a data value of the received next symbol is equal to a data value of the transmitted present symbol, designating a next bit of the bit pattern as the present symbol;

(3) if it is determined that all bits of the bit pattern have been transmitted to the reader, exiting the binary traversal.

25. The method of claim 24, wherein step (3) includes the step of:

if it is determined that all bits of the bit pattern have been transmitted to the reader, transitioning an operating state of the tag device from a tree traversal state to a dormant state.

26. The method of claim 23, wherein step (h) comprises the step of:

transitioning an operating state of the tag device from a tree traversal state to a mute state.

27. The method of claim 23, wherein the bit pattern is a tag identification number, wherein step (a) comprises the step of:

(a) designating a first bit of the tag identification number as a present symbol.

28. A method in a radio frequency identification (RFID) tag device for responding to an interrogation by a reader, wherein the tag device stores a bit pattern, wherein the bit pattern includes an identification number portion, comprising the steps of:

(a) designating a first bit of the bit pattern as a present symbol;

(b) receiving a first symbol from the reader;

(c) transmitting the present symbol to the reader;

(d) receiving a next symbol from the reader;

(e) if the received next symbol is a "NULL" symbol, exiting the interrogation;

(f) if a data value of the received next symbol is not equal to a data value of the transmitted present symbol, exiting the interrogation;

(g) if a data value of the received next symbol is equal to a data value of the transmitted present symbol, designating a next bit of the bit pattern as the present symbol; and

(h) returning to step (c).

29. The method of claim 28, wherein step (g) includes the step of:

(1) determining whether all bits of the bit pattern have been transmitted to the reader;

(2) if it is determined that all bits of the bit pattern have not been transmitted to the reader, returning to step (c); and

(3) if it is determined that all bits of the bit pattern have been transmitted to the reader, transitioning the operating state to the first state.

30. The method of claim 28, wherein the bit pattern includes a sensor data portion.

31. The method of claim 28, wherein the interrogation is a specific read interrogation.

32. The method of claim 28, wherein the interrogation is a general read interrogation.

33. The method of claim 28, further comprising the step of:

(i) transitioning the operating state to a tree traversal state after receiving the first symbol in step (b).

34. A radio frequency identification (RFID) tag device, comprising:

means for storing a bit pattern;

means for responding to an interrogation by a reader, including means for comparing symbols received from said reader to portions of said bit pattern using a binary traversal algorithm, wherein said interrogation is concluded if a symbol received from said reader is a "NULL" symbol; and

means for transmitting data to said reader.

35. A method for identifying a specific radio frequency identification (RFID) tag device in a population of tag devices, wherein the tag device stores a unique tag identification bit pattern and a second bit pattern, comprising the steps of:

(a) receiving a desired tag identification bit pattern from a host system;

(b) designating a first bit of the desired tag identification bit pattern as a present symbol;

(c) transmitting the present symbol to the population of tag devices;

(d) determining whether a next bit exists in the desired tag identification bit pattern;

(e) if it is determined in step (d) that the next bit does not exist, proceeding to step (g);

(f) if it is determined in step (d) that the next bit exists, designating the next bit as the present symbol and returning to step (c);

(g) receiving a symbol from the population of tag devices;

(h) storing a logical value of the received symbol in an accumulator as a bit of a bit pattern;

(i) determining whether the bit stored in step (h) is a last bit of the bit pattern in the accumulator;

(j) if it is determined in step (i) that the bit stored in step (h) is the last bit, proceeding to step (l);

(k) if it is determined in step (i) that the bit stored in step (h) is not the last bit, transmitting the bit stored in step (h) as the present symbol and returning to step (g); and

(l) comparing an expected bit pattern to the bit pattern stored in the accumulator.

36. The method of claim 35, wherein step (l) includes the steps of:

(1) if the expected bit pattern is the same as the bit pattern stored in the accumulator, indicating that the specific tag has been identified; and

(2) if the expected bit pattern is not the same as the bit pattern stored in the accumulator, indicating that the specific tag has not been identified.

37. A method in a radio frequency identification (RFID) reader for interrogating a plurality of tag devices in a population of tag devices, comprising the steps of:

(a) initializing a bit pattern stored in an accumulator;

(b) initializing a counter value;

(c) transmitting a first symbol to the plurality of tags;

(d) determining whether at least one symbol is received from the plurality of tags;

(e) if it is determined in step (d) that the at least one symbol has not been received, proceeding to step (l);

(f) storing a logical value corresponding to the received at least one symbol in the accumulator as a bit of the bit pattern;

(g) incrementing the counter value;

(h) if the counter value is equal to a pre-determined limit, proceeding to step (l);

(i) determining a next symbol based upon the at least one symbol determined to be received in step (d);

(j) transmitting the next symbol to the plurality of tags;

(k) proceeding to step (d); and

(l) transmitting the bit pattern to a host system.

38. The method of claim 37, further comprising the step of:

(m) repeating steps (a)-(l) if the bit pattern is not empty in step (l).

39. The method of claim 37, wherein the at least one symbol is included in a set of possible symbols, wherein the set of possible symbols includes a data "0" and a data "1," wherein step (d) includes the step of:

determining whether the at least one symbol included in the set of possible symbols is received from the plurality of tags.

40. The method of claim 37, wherein the first symbol is a data "NULL," wherein step (c) includes the step of:

transmitting the data "NULL" to the plurality of tags.

41. The method of claim 37, wherein the next symbol determined in step (i) is a data "0" or a data "1," further comprising the step of:

transmitting the data "0" or data "1" to the plurality of tags.

42. A method in a radio frequency identification (RFID) reader for interrogating a plurality of tag devices, comprising the steps of:

(a) receiving an identification number from a host system;

(b) designating the first bit of the identification number as a current bit;

(c) transmitting a first symbol to the plurality of tag devices;

(d) determining a next symbol from the current bit;

(e) transmitting the next symbol to the plurality of tags;

(f) determining whether a next bit exists in the identification number;

(g) if the next bit is determined in step (f) to not exist, proceeding to step (j);

(h) designating the next bit of the identification number as the current bit;

(i) proceeding to step (d);

(j) determining whether at least one symbol of a set of symbols is received from the plurality of tags;

(k) if it is determined in step (i) that at least one symbol was not received, communicating to the host system that the identification number does not exist; and

(l) if it is determined in step (i) that at least one symbol was received, communicating to the host system that the identification number exists.

43. A method in a radio frequency identification (RFID) reader for interrogating a plurality of tag devices comprising the steps of:

(a) receiving an identification number from a host system;

(b) designating the first bit of the identification number as a current bit;

(c) transmitting a first symbol to the plurality of tags;

(d) determining a next symbol from the current bit;

(e) transmitting the next symbol to the plurality of tags;

(f) determining whether a next bit exists in the identification number;

(g) if the next bit is determined in step (f) to not exist, proceeding to step (j);

(h) designating the next bit as the current bit;

(i) proceeding to step (d);

(j) initializing a bit pattern stored in an accumulator;

(k) initializing a counter value;

(l) determining whether at least one symbol of a set of symbols is received from the plurality of tags;

(m) if it is determined in step (l) that at least one symbol was not received, proceeding to step (t);

(n) storing a logical value corresponding to the received at least one symbol in the accumulator as a bit of the bit pattern;

(o) incrementing the counter value;

(p) if the counter value is equal to a pre-determined limit, proceeding to step (t);

(q) determining a next symbol based upon the at least one symbol determined to be received in step (l);

(r) transmitting the next symbol to the plurality of tags;

(s) proceed to step (l);

(t) determining whether the bit pattern stored in the accumulator is equal to an anticipated bit pattern;

(u) if it is determined in step (t) that the bit pattern stored in the accumulator is equal to the anticipated bit pattern, communicating to the host system that the identification number does exist; and

(v) if it is determined in step (t) that the bit pattern stored in the accumulator is not equal to the anticipated bit pattern, communicating to the host system that the identification number does not exist.

44. A method for interrogating a population of tag devices, comprising the steps of:

(a) designating a bit as a present symbol;

(b) transmitting the present symbol to the population of tag devices;

(c) receiving a signal;

(d) determining whether a symbol transmitted from the population of tags is present in the received signal;

(e) if the symbol transmitted from the population of tags is not present in the received signal, proceeding to step (g);

(f) if the symbol transmitted from the population of tags is present in the received signal,

storing a logical value of the symbol transmitted from the population of tags as a bit in a register,

designating the logical value of the symbol transmitted from the population of tags as the present symbol, and

returning to step (b);

(g) if no bits are stored in the register, exiting operation; and

(h) if one or more bits are stored in the register,

transmitting a NULL symbol,

clearing the register, and

returning to step (a).

45. A method in a radio frequency identification (RFID) tag device for responding to an interrogation by a reader, wherein the tag device stores a bit pattern, comprising the steps of:

(a) designating a first bit of the bit pattern as a present symbol;

(b) receiving a symbol from the reader;

(c) if the received symbol is a "NULL" symbol, exiting the interrogation;

(d) if a data value of the received symbol is not equal to a data value of the present symbol, proceeding to step (f);

(e) if a data value of the received symbol is equal to a data value of the present symbol, transmitting the present symbol to the reader;

(f) designating a next bit of the bit pattern as the present symbol; and

(g) returning to step (b).

46. A method in a reader for interrogating a population of radio frequency identification (RFID) tag devices, wherein each tag device stores a bit pattern, wherein the bit pattern includes an identification number portion, comprising the steps of:

(a) initializing a value stored in a counter;

(b) initializing a register;

(c) transmitting a first symbol to the population of tag devices, wherein the first symbol represents a first data value;

(d) determining whether at least one response to the first symbol was received from the population of tags;

(e) if the at least one response was determined to be received in step (d), indicating in a bit position in the register that at least one response to the first symbol was received, wherein the bit position is equal to the value stored in the counter;

(f) if the bit position in step (e) is a last bit position in the register, skipping steps (g)-(i);

(g) incrementing the value stored in the counter;

(h) transmitting the first symbol to the population of tag devices; and

(i) returning to step (d).

47. The method of claim 46, further comprising the steps of:

(j) transmitting a signal to initialize the population of tags;

(k) initializing the value stored in the counter;

(l) initializing a second register;

(m) transmitting a second symbol to the population of tag devices, wherein the second symbol represents a second data value;

(n) determining whether at least one response to the second symbol was received from the population of tags;

(o) if the at least one response was determined to be received in step (d), indicating in a bit position in the second register that the at least one response to the second symbol was received, wherein the bit position in the second register is equal to the value stored in the counter;

(p) if the bit position in step (o) is a last bit position in the second register, skipping steps (q)-(s);

(q) incrementing the value stored in the counter;

(r) transmitting the second symbol to the population of tag devices; and

(s) returning to step (d).

48. The method of claim 47, wherein a bit length of the first register is equal to a length of the bit pattern, and a bit length of the second register is equal to a length of the bit pattern, further comprising the steps of:

(t) comparing the first register to the second register; and

(u) determining from the comparison of step (t) a reduced number of bits required to identify a tag device in the population of tag devices.

49. A reader for interrogating a population of radio frequency identification (RFID) tag devices, wherein each tag device in the population of tag devices stores an identification bit pattern, wherein the stored identification bit pattern includes at least one common bit position having the same logical value for all tag devices in the population of tag devices, comprising:

means for storing a bit pattern mask, wherein a bit length of the stored bit pattern mask is equal to the bit length of the stored identification bit pattern, wherein the stored bit pattern mask indicates the at least one common bit position;

means for transmitting a first bit as a first symbol to the population of tag devices, wherein the first bit corresponds to a first bit position in the bit length of the stored identification bit pattern;

means for receiving at least one symbol from the population of tag devices;

means for analyzing the at least one symbol received from the population of tag devices relative to the bit pattern mask; and

means for transmitting the next bit as a symbol to the population of tag devices.

50. A reader for interrogating a population of radio frequency identification (RFID) tag devices, wherein each tag device stores a bit pattern, wherein the bit pattern includes an identification number portion, comprising the steps of:

a counter, wherein said counter has a value stored therein;

a register;

means for transmitting a first symbol to the population of tag devices, wherein the first symbol represents a first logical value;

means for determining whether at least one response to the first symbol was received from the population of tags, wherein if the at least one response was determined to be received, indicating in a bit position in the register that at least one response to the first symbol was received, wherein the bit position is equal to the value stored in the counter; and

means for incrementing said value stored in the counter.

51. A method in a reader for interrogating a population of radio frequency identification (RFID) tag devices, wherein each tag device in the population of tag devices stores an identification bit pattern, wherein the stored identification bit pattern includes at least one common bit position having the same logical value for all tag devices in the population of tag devices, comprising the steps of:

(a) storing a bit pattern mask, wherein a bit length of the stored bit pattern mask is equal to the bit length of the stored identification bit pattern, wherein the stored bit pattern mask indicates the at least one common bit position;

(b) transmitting a first bit as a first symbol to the population of tag devices, wherein the first bit corresponds to a first bit position in the bit length of the stored identification bit pattern;

(c) receiving at least one symbol from the population of tag devices;

(d) if a next bit position does not exist in the bit length of the stored identification bit pattern, skipping steps (e)-(f);

(e) determining whether the mask indicates the next bit position as a common bit position; and

(f) if it is determined in step (e) that the mask does not indicate the next bit position as a common bit position,

(1) transmitting the next bit as a symbol to the population of tag devices, and

(2) returning to step (c).

52. The method of claim 51, further comprising the step of:

(a1) before step (a), performing a superposition analysis to generate the bit pattern mask.

53. The method of claim 52, further comprising the step of:

(a1) before step (a), analyzing information related to the population of tag devices to generate the bit pattern mask.

54. A method in a reader for interrogating a population of radio frequency identification (RFID) tag devices, wherein each tag device stores an equal bit length identification number, comprising the steps of:

(a) receiving a first bit pattern that is a common subset of bits of the identification number of all tag devices of the population of tag devices;

(b) initializing a counter value to a bit length of the identification number minus the length of the first bit pattern received in step (a);

(c) initializing a second bit pattern in an accumulator;

(d) transmitting a first symbol to the plurality of tags;

(e) determining whether at least one symbol of a set of symbols is received from the plurality of tags;

(f) if it is determined in step (e) that at least one symbol was not received, proceeding to step (m);

(g) storing a logical value corresponding to the received at least one symbol in the accumulator as a bit of the second bit pattern;

(h) decrementing the counter value;

(i) if the counter value is equal to zero, proceeding to step (m);

(j) determining a next symbol based upon the at least one symbol determined to be received in step (e);

(k) transmitting the next symbol to the plurality of tags;

(l) proceeding to step (e);

(m) combining the first bit pattern with the second bit pattern to form a third bit pattern; and

(n) transmitting the third bit pattern to a host system.

55. The method of claim 54, wherein step (a) comprises the step of:

calculating the first bit pattern in the reader.

56. The method of claim 54, wherein the first bit pattern is calculated in the host system, wherein step (a) comprises the step of:

receiving the first bit pattern from the host system.

57. The method of claim 54, wherein step (m) comprises the step of:

appending the first bit pattern to the second bit pattern to form the third bit pattern.

58. A method for interrogating a population of tag devices to determine the presence of a first tag device and a second tag device, wherein the first tag device stores a first tag identification bit pattern of a first bit length N and the second tag device stores a second tag identification bit pattern of a second bit length M, comprising the steps of:

(a) designating a first bit of the first identification bit pattern as a present symbol;

(b) transmitting the present symbol to the population of tag devices;

(c) receiving at least one symbol from the population of tag devices;

(d) storing a logical value of the received symbol as a bit in a register; and

(e) repeating steps (a)-(d) for each additional bit of the first identification pattern such that the register stores N bits.

59. The method of claim 58, wherein the stored N bits equal the first tag identification bit pattern.

60. The method of claim 58, further comprising the step of:

(f) providing the stored N bits to a host system.

61. The method of claim 58, further comprising the step of:

(a1) before step (a), receiving the first identification bit pattern from a host system.

62. The method of claim 58, further comprising the steps of:

(f) transmitting a "NULL" symbol to the population of tag devices;

(g) initializing the register;

(h) designating a first bit of the second identification bit pattern as the present symbol;

(i) transmitting the present symbol to the population of tag devices;

(j) receiving at least one symbol from the population of tag devices;

(k) storing a logical value of the received symbol as a bit in a register; and

(l) repeating steps (h)-(k) for each additional bit of the second identification pattern such that the register stores M bits.

63. The method of claim 62, wherein the stored M bits equal the second tag identification bit pattern.

64. The method of claim 62, further comprising the step of:

(m) providing the stored M bits to a host system.

65. The method of claim 62, further comprising the step of:

(h1) before step (h), receiving the second identification bit pattern from a host system.